Claims

1. A control circuit for relay-operated gas valves, with a relay for opening and/or closing a gas valve and with a failsafe circuit for the relay, a control device being connectable to an input of the failsafe circuit, and the failsafe circuit only supplying the relay with a voltage and/or current necessary for opening the gas valve when an input signal having at least two different frequency signals succeeding each other in time is supplied at the input of the failsafe circuit by the control device.

2. The control circuit of claim 1, wherein the failsafe circuit includes a charging circuit, the charging circuit having at least one capacitor, and the charging circuit charging at least one of the at least one capacitors of the charging circuit upon the application or presence of a first frequency signal in the input signal.

3. The control circuit of claim 2, wherein the charging circuit charges the at least one of the one or more capacitor of the charging circuit exclusively upon the presence of the first frequency signal in the input signal.

4. The control circuit of claim 2, wherein the charging circuit, upon the application or presence of a second frequency signal in the input signal, the second frequency signal having a lower frequency than the first frequency signal, does not charge the at least one of the one or more capacitor of the charging circuit.

5. The control circuit of claim 2, wherein upon the application or presence of a second frequency signal in the input signal, the second frequency signal having a

lower frequency than the first frequency signal, the at least one of the one or more capacitor of the charging circuit discharges.

6. The control circuit of claim 5, wherein the failsafe circuit includes a drive circuit coupled to the relay, the drive circuit, upon the application or presence of a second frequency signal in the input signal, supplying the relay with a voltage and/or current necessary for opening the gas valve.

7. The control of claim 6, wherein the drive circuit has at least two transistors, a base of a first transistor being connected via a resistor to a capacitor of the charging circuit, and the first transistor of the drive circuit only conducting when the capacitor of the charging circuit discharges itself upon the application of the second frequency signal in the input signal.

8. The control circuit of claim 7, wherein a collector of the first transistor is connected via an interposed resistor to a supply voltage, and that an emitter of the first transistor is connected to a ground potential.

9. The control circuit of claim 8, wherein a second transistor is switched with the first transistor in such a manner that a collector of the second transistor is connected to the base of the first transistor and an emitter of the second transistor is connected to a ground potential.

10. The control circuit of claim 9, wherein a base of the second transistor is coupled via an interposed resistor (28) with the input (13) of the failsafe circuit (12).

11. The control circuit of claim 6, wherein the drive circuit includes two Darlington transistor circuits, a diode connected in parallel to the relay and, making contact between the two Darlington transistor circuits, a series connection of a resistor and a capacitor.

12. The control circuit of claim 1, wherein the at least two different frequency signals include a first frequency signal and a second frequency signal, and wherein the first frequency signal has a frequency of around 1000 kHz and the second frequency signal has a frequency of around 5 kHz, the two frequency signals being applied in the input signal succeeding one another in time in such a manner that in each case a time span of around 40 ms with the first frequency signal of around 1000 kHz is followed by a time span of around 80 ms with the second frequency signal of around 5 kHz.

13. The control circuit of claim 1, wherein only supplies the relay with a voltage and/or current necessary for opening the gas valve if the two different frequency signals are applied succeeding each other in time by definition in the input signal.

14. The control circuit of claim 1, wherein the at least two different frequency signals include a first frequency signal and a second frequency signal, and wherein the first frequency signal and the second frequency signal are applied successively in the input signal in such a way that a first time period with the first frequency signal is respectively followed by a second time period with the second frequency signal.

15. A fail-safe circuit for controlling a relay that controls the opening of a gas valve, the fail-safe circuit comprising:

at least one input that can be connected to a gas valve controller;

at least one output that can be connected to the relay; and

the fail-safe circuit configured to only supply an output signal to the relay to open the gas valve via the at least one output of the fail safe circuit if/when the gas valve controller provides an input signal having at least two different frequency signals to the at least one input of the fail-safe circuit.

16. The fail-safe circuit of claim 15 wherein the fail-safe circuit is configured to only supply an output signal to the relay to open the gas valve via the at least one output of the fail safe circuit when the gas valve controller provides an input signal that includes a first frequency signal that is coordinated in time with a second frequency signal.

17. The fail-safe circuit of claim 15 wherein the fail-safe circuit is configured to only supply an output signal to the relay to open the gas valve via the at least one output of the fail safe circuit if/when the gas valve controller provides an input signal that includes a first frequency signal for a first period of time followed by a second frequency signal for a second period of time.

18. The fail-safe circuit of claim 17 wherein the fail-safe circuit is configured to only supply an output signal to the relay to open the gas valve via the at least one output of the fail safe circuit if/when the first frequency signal is not supplied during the second period of time, and the second frequency signal is not supplied during the first period of time.

19. A method for controlling a relay that controls the opening of a gas valve, the method comprising the steps of:

determining if a gas valve controller is currently providing a valid gas valve control signal;

providing a signal to the relay in accordance with the gas valve control signal if the determining step determines that the gas valve controller is currently providing a valid gas valve control signal; and

closing the gas valve via the relay if the determining step determines that the gas valve controller is not currently providing a valid gas valve control signal.

20. The method of claim 19 wherein the determining step includes determining if the gas valve controller is providing an input signal that includes a first frequency signal for a first period of time followed by a second frequency signal for a second period of time.

21. The method of claim 20 further comprising the steps of:

charging a capacitor of a charging circuit during the first period of time when the input signal includes the first frequency signal; and

charging a capacitor of a drive circuit during the second period of time when the input signal includes the second frequency signal, wherein a charged voltage across the capacitor of the driving circuit provides a current to the relay to maintain the relay in its current state when the capacitor of the charging circuit is charging.